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FIBERS OF THE PACIFIC UNIT

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FIBERS OF THE PACIFIC UNIT

This unit of THINGS of science consists of five specimens, five museum-type cards and this explanatory leaflet.

The tiny islands and island clusters that make up the Trust Territory of the Pacific Islands are located in the western Pacific, north of the equator. Such battle-famous islands as Saipan, Peleliu and Kwajalein, and such atomic-bomb experimental areas as Bikini and Eniwetok are included in this Micronesian group.

The far-flung, non-malarial islands comprising the Trust Territory, formerly held by Japan as a League of Nations mandated territory, were placed in 1947 under the sponsorship of the United States by the United Nations as a "strategic trusteeship." Some 55,000 people, mostly brown-skinned natives, live on these 2,000 or so islands, islets and exposed reefs having a combined land area of 687 square miles. Most of the islands are small and of coral formation, while the few large ones, which comprise most of the land area, are extinct volcanoes. Some of the islands are so tiny and barren they are not inhabited; others offer enough food and clothing to meet the natives' elementary needs.

These islands are scattered over an area about two-thirds the size of the United States. Tobi island in the extreme west of the Carolines is about 2,765 statute miles from Mili atoll in the extreme east of the Marshalls. The Marianas, except Guam, which is an outright possession of the United States, also belong to the Trust Territory group.

The specimens in this unit of THINGS of science have been selected to give you a good idea of typical fibers used by natives of the Trust Territories. Identify them, matching each specimen with its museum-type card:

COCONUT HUSK—Fibrous covering of coconut, used for twine (mass of coarse, stiff fibers).

COIR TWINE—Strong cord made from beaten coconut husk (short length of twine).

COCONUT LEAF FIBER—Pliable fiber obtained from center vein of coconut leaflet (thin fiber curled into rounded strand).

PANDANUS FIBER—Matting woven from fibrous leaves of screw pine family (piece of woven matting).

HIBISCUS FIBER—Ribbon-like fiber obtained from inner bark of blossoming

tree (sieve-like structure gives fiber a woven appearance).

NATIVE ART

There is a plentiful supply of native raw materials for weaving available in the Trust Territories. The coconut palm furnishes the most abundant and popular materials for handicraft as coconut husks, leaf fronds, young shoots and green suckers are all used as fibers. The longest fibers obtainable on the islands are those stripped from the leaves of the pandanus tree; they make excellent mats for walls and floor. "Grass skirts" are traditionally made from the lovely inner bark of the native hibiscus tree.

Many articles used by the natives today are essentially the same as those employed before the early explorers came to the islands not long after Columbus discovered America. With the arrival and colonization through the centuries of Spaniards, Germans, Japanese and Americans, however, some new trends have been added to island arts and crafts, some substitutions and additions made. The woven lava-lava loincloth and grass skirt, cast aside by the natives for cotton clothes, for instance, today probably are used more by tourists than by the islanders.

Handicrafts are traditionally the work of adult men and women, those of middle age doing the finer, more difficult weaving. Only recently have handicrafts been taught to any extent in schools to growing children.

The specimens come to you with the compliments of the Island Trading Company of Micronesia. Gathered by the natives of the Trust Territory, some of the fibers would normally have gone into tourist items such as table mats, coasters, pocket books and cigarette cases; some would have been used by the natives themselves for wall and floor mats, baskets and hats.

The Island Trading Company of Micronesia was set up by the United States government to provide for the economic development and self sufficiency of the island natives. It was designed, where circumstances permit, to retire from operation in those areas where islanders demonstrate their ability to conduct their own business affairs.

The company purchases throughout the world at the best possible prices those items of trade goods such as food and clothing required by the natives. It collects and buys from the natives copra or

dried coconut meat, handicraft and other island products for distribution and sale to world markets at the highest possible return to these people. In addition, it furnishes a banking service, cashing checks and other negotiable instruments and providing savings deposit accounts.

FIBERS FROM COCONUT TREES

Experiment 1. Pull a few of the coconut fibers to test their strength, then bend in all directions to find how pliable they are. Twist several together to discover why these coarse fibers make such a strong, durable rope.

Experiment 2. If you live where coconuts grow or if fresh, whole coconuts in the husk are available in your local market, notice the outer husk. This husk, often difficult to remove when you want the white meat inside, furnishes the natives with a readily available fiber. Compare your specimen with the husk of a ripe coconut for color and pliability. Try shredding the husk with your hands to see if the fibers come apart easily. Beat it with a stick to see if that helps break the fibers apart. Cover with water and put aside for a week, then see if they come apart more readily.

In preparing the fiber, the natives soak

the coconut husks in water for about two weeks, then beat them with a stick and finally lay them in the hot tropical sun to dry. Scrubbing brushes, sandals and door mats are made from this coarse material.

The chief use of the coconut husk fiber is for twine and rope. This twine often is used instead of nails, screws and bolts in fashioning fishing spears and canoes; it is used in tying fish nets and in lashing houses firmly to their foundations. Strong rope is made by twisting three plies of cord such as your specimen into one thick rope.

Experiment 3. Test the strength of your coir twine specimen. Untwist an end to study how it was made. Using this as a model, fashion a piece of twine from the coconut husk fibers included in this kit.

Experiment 4. Strong fibers can be obtained from the stiff leaves of the yucca plant or Adam's needle. Native to America, it grows abundantly in Florida, Texas and Mexico. If these plants grow in your neighborhood, pull a few fibers from the leaves. By carefully breaking off the tough tip of the leaf and keeping attached the two fibers which grow on the outside

edges of the leaf, you can obtain a nature-made needle with thread attached, ready for sewing.

The next time you see a milkweed or nettle weed, scrape the stem and pull loose the fibers beneath. The inner bark of ramie, sisal, flax and jute are well-known sources of commercial fibers.

Experiment 5. Uncurl a bit of palm fiber to see how broad the fiber really is. If the fiber tends to break, soak it in water before uncurling; before weaving the fibers are moistened to make them more pliable. How does this fiber compare with the coconut husk fiber for softness and pliability, both when dry and when wet? Does the fact that one side of the coconut leaf fiber is quite shiny, the other dull, give a clue as to how the fiber was made?

Your palm fiber was made from the tender third or fourth frond or branch from the center of a coconut palm. The leaves were first cut from the branch of the tree, then the center vein was cut from the leaflet and both sides scraped. The shiny side of your specimen was once the outside of the leaf, the dull side grew next to the center vein. The fiber was dried in the sun, then cut into strips

such as your specimen. These thin strips, as you have noticed, usually curl together to make a rounded fiber. Grown and prepared on Ponape, one of the largest of the Caroline islands, fiber of this type is exported to Japan where it is made into a Panama-type hat.

Natives of the Trust Territories often use unbleached coconut fronds exactly as they come from the tree. These are pressed into service as brooms for sweeping the ground near their homes; dried ones are burned as torches for night fishing. Skillfully sewn together with coconut fiber, the fronds make serviceable thatched roofs and walls. They also furnish an ever-present material for basket-making. Carrying baskets are often woven entirely around the breadfruit, fish or cooked food, and the ends tied into a strong handle; to open, the hard middle stem of the frond is split lengthwise.

Experiment 6. If you live in the land of the palm and banana, bundle a few of the dried leaves together to see what an effective broom they make for sweeping the ground. If you live farther north, you can get some idea of how these fronds are used by working with corn husks. Collected after the ripe corn has

been harvested, the dried leaves that protected the ear of corn make coarse brooms or may be braided into serviceable door mats.

FIBER FROM SCREW PINE

Experiment 7. Notice how soft and smooth is the pandanus fiber of which your piece of matting is made. Pull loose an individual fiber to see that it is folded double for greater thickness and durability. Doubled while still flexible, the dry fibers will probably split when you try to flatten them out. The fiber itself, once perfectly straight, now waves slightly, indicating where the fibers with which it was woven lay above and where below.

The pandanus tree, member of the screw pine family, is not really a pine, but a distant relative of the palm family. It has long, sword-like leaves with sawtooth edges. A tropical and subtropical plant, it is often grown as a potted plant in greenhouses, hotels and handsome residences; it is used as veranda and lawn decoration. The next time you see a plant of this type, with stilt-like roots raising it above the soil, ask what it is. If a pandanus, study the leaf structure.

Some varieties of pandanus have huge clumps of long, fibrous leaves that pro-

duce fibers much longer than those obtainable from coconut fronds. For centuries the people of the Pacific islands have used these long fibers to weave wall and floor mats. Shorter pandanus fibers, obtained from the leaf of almost any pandanus tree, are woven into table mats, handbags and waste baskets sold to tourists. As such mats are now popular in the United States, look around your home and nearby stores to see if they are in use or for sale locally. What other natural fibers, such as banana leaves, do you find woven into mats? What fibers are used for baskets and other craft objects?

The young, flexible pandanus leaves are cut by the natives either early in the morning or late in the evening, when damp with dew. The thorny spikes which border the long, ribbon-like leaves are removed with a sharp knife or piece of shell. The leaves are also split down the center to get rid of the tough midrib.

Pandanus leaves are softened by being passed slowly over hot coals, then soaked overnight in the salty water of a nearby lagoon. Bending the fiber over a spoon, knife or edge of a clam shell gives it greater pliability. It is then bleached and dried in the sun.

The islanders use only the natural shades of the fiber in their own mats and baskets, but the fibers are dyed for many commercial articles. Finally, the fibers are dampened and rolled up in a cloth to be kept soft and moist for weaving. Just before use, the leaves are cut into narrow strips, the width largely being determined by the purpose and size of the article to be made.

Experiment 8. Corn husks and cattail leaves may help you visualize pandanus fiber. Collect the leaves when still green. Split the broad ones into strips a quarter inch or so wide, discarding the tough, center rib. Dry the strips in the sun, work them to make pliable and moisten when ready for use.

If you know how to weave, work the strips into a small mat. Otherwise, use them for the woof or filling only, and use string for your warp or framework. Cut a simple frame from a piece of cardboard, or use a discarded picture frame. Across the top and bottom make a number of evenly-spaced marks. Prepare the warp by sewing string through these marks on the cardboard or by looping it around tacks driven in the wooden frame. Run the warp twine from top to bottom, and

back again. Work the leaf strips in across the twine, over one string and under the next, alternating each row. When you come to the end of one strip and must begin working with another, overlap the ends for greater strength.

FIBER FROM FLOWERING TREE

Experiment 9. Look at your hibiscus fiber, which is one of the inner layers of bark of a flowering tree or large shrub. As many layers grow close together, feel your specimen to see if perhaps you have several fibers instead of just a single one. If so, separate them and look at the individual, sieve-like structure of the fiber. Pull the fiber lengthwise and notice how strong it is; pull it crosswise and see how easily it splits.

The hibiscus tree from which the fiber was obtained is native to the Trust Territories and a close relative of the cultivated hibiscus, noted for its showy flowers. The bark of this tree has been used in handicrafts for centuries by the Pacific islanders. Pulled from the tree in long, up-and-down strips, it is soaked in salty water for several days, then peeled and hung over ropes to dry. The individual fibers are separated, then split into long, thin strips.

Hibiscus bark was once widely used for grass skirts and loincloth wrap-arounds, picturesque garments which today have largely been replaced by imported dresses, skirts and trousers of cotton cloth. On some islands, only men wore grass skirts, which usually reached from the waist to just below the knee. In the less-visited areas, such as on Ponape, men can still be seen wearing the time-honored garments as their only article of clothing. On Yap, at the other end of the Caroline islands, it is the women who wear the grass skirts.

Experiment 10. The bark of some trees grown in the temperate zones also come off in long, fibrous strips. Perhaps the most famous of these is the birch. If you live in the country, look around for birch, hickory, willow, elm, basswood or linden, and other trees with bark that might be useful for weaving. Cut through the bark near the root of the tree and see how long a strip you can peel off.

Experiment 11. To become more familiar with the area from which the specimens came, locate the various Trust Territory islands on an up-to-date map of the Pacific. If you have friends who fought in this region during the war, ask

them to tell you about the islands. Become more familiar with the people who inhabit the islands and their handicraft by studying exhibits in a museum or looking them up in books.

OTHER FIBERS

The wiry stems and blades of some of the tall reeds that grow in profusion in the Pacific Islands are also used for weaving. Processed much like coconut or hibiscus fibers, washing, soaking and drying make the fibers pliable for braiding or weaving.

Experiment 12. Sweet grass was much used by the American Indians in weaving, so if you are familiar with it, prepare some. It is always best to harvest grasses and leaves after they are mature, but not completely dried. Look around for reeds and grasses that might lend themselves to weaving.

Experiment 13. Numerous other materials readily available in North America have been used throughout the centuries for weaving and basket-making. Explore your own neighborhood for some that might be useful. Some will be so thick or broad they should be split; others will need little preparation except drying.

Label each carefully and note which you consider the most effective weaving material.

Supple vines such as that of the wild honeysuckle, long unbranching roots such as that of the spruce or cedar, and pliable stems such as that of the maidenhair fern are excellent raw materials. Straw made by drying the stems of wheat and rye is an old favorite. Bamboo, cattail stalks and corn stalks have been used effectively. Pine needles, particularly of the long leaf pine, are sometimes used. Strips or splints of oak, hickory, ash and cedar, which wood splits easily if pounded, are traditional basket-making material.

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COCONUT LEAF FIBER

Pliable fiber obtained from center vein of coconut leaflet

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COCONUT HUSK

Fibrous covering of coconut, used for twine

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COIR TWINE

Strong cord made from beaten coconut husk

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received by a Group of Friends of Science; sponsored and distributed without profit by Science Service, the Institution for the Popularization of Science. 1719 N Street N. W., Washington 6, D. C. Watson Davis, Director.

PANDANUS FIBER

Matting woven from fibrous leaves of screw pine family

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received by a Group of Friends of Science; sponsored and distributed without profit by Science Service, the Institution for the Popularization of Science. 1719 N Street N. W., Washington 6, D. C. Watson Davis, Director.

HIBISCUS FIBER

Ribbon-like fiber obtained from inner bark of blossoming tree

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